

NON-PUBLIC?: N
ACCESSION #: 8908140325
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Surry Power Station, Unit 1 PAGE: 1 of 5

DOCKET NUMBER: 05000280

TITLE: Turbine Trip/Reactor Trip on Hi-Hi Steam Generator Level
Following Turbine Runback Caused by a Blown Fuse in NI-41
EVENT DATE: 07/09/89 LER #: 89-026-00 REPORT DATE: 08/07/89

OPERATING MODE: N POWER LEVEL: 063

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
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COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: JB COMPONENT: FCV MANUFACTURER: C635
REPORTABLE NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On July 9, 1989 with Unit 1 at 63% power, instrument technicians were calibrating Power Range Nuclear Instrumentation (NI) when a failure of the NI occurred. This resulted in a spurious NI dropped rod signal and automatic initiation of a 30% power turbine runback. Following the turbine runback operators had difficulty stabilizing steam generator levels due to inappropriate operator response and equipment malfunction. A turbine trip/reactor trip occurred due to a high-high level condition in the "B" steam generator two minutes and 45 seconds after initiation of the turbine runback. The failure of the power range NI was due to a blown control power fuse caused by the use of a voltmeter with an ungrounded power supply. The personnel involved were disciplined. This event and similar events related to improper use of meters will be discussed during the instrument technicians continuing training classes. Instrument technicians have been issued instructions to use grounded meters for testing unless specifically directed otherwise.

END OF ABSTRACT

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1.0 Description of the Event

On July 9, 1989 with Unit 1 at 63% power, instrument technicians were calibrating Channel I Power Range Nuclear Instrumentation (NI) (EIIS-IG) per calibration procedure CAL 630 when a failure of the NI occurred. This resulted in a spurious NI dropped rod signal and automatic initiation of a 30% power turbine runback.

Prior to and during the runback, the rod control system (EIIS-RD) and "B" Main Feedwater Regulating Valve (FRV) (EIIS-JB) were in manual due to automatic control problems. Following the initiation of the runback, the steam dump valves (turbine bypass valves) (EIIS-V) opened as designed. However, the control room operator misdiagnosed the event and erroneously closed the valves. This action, coupled with the above systems being in manual control, complicated the operators' response to the transient and an overfill of the "B" steam generator (EIIS-SG) resulted. At 0645 hours, two minutes and 45 seconds after the initiation of the turbine runback, a turbine trip/reactor trip occurred due to a high-high level condition in the "B" steam generator.

Following the trip, safety systems functioned as designed with the exception of Channel I source range NI (NI-31) which had to be manually reinstated. Source Range Channel II did automatically reinstate. In addition, the control room operator placed the steam dump control in the proper mode eight seconds after the turbine trip, at which time they opened and functioned as designed.

2.0 Safety Consequences and Implications

During this event, the turbine protection and reactor protection systems functioned as designed. In addition, plant safety systems remained operable and plant parameters remained well within the bounds of the accident analysis. Therefore, the health and safety of the public were not affected.

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3.0 Cause

The events leading to the reactor trip were caused by a combination of personnel errors and equipment malfunctions.

The failure of the power range NI was due to a blown control power fuse

caused by the use of a voltmeter with an ungrounded power supply. The instrument technicians performing the NI calibration procedure initially questioned whether a grounded or ungrounded power supply was required for the voltmeter being used. However, they continued with the procedure using an ungrounded meter without properly resolving the matter.

Subsequent testing of several volt meters similar to the one used during the test procedure determined a voltage potential exists between the positive lead of the meter and ground when an ungrounded power supply is used. This voltage potential was sufficient to induce enough current in the NI control power circuit to blow the fuse.

Following the runback, the control room operator initially misdiagnosed the event and erroneously closed the steam dump valves. He believed the steam dump valves had failed open, initiating the transient. Sluggish operation of the "B" FRV and manual rod control (as previously stated, rods were in manual due to a malfunction of the automatic rod control system) hampered operators' efforts to stabilize the plant after the runback.

Source range detector NI-31 did not automatically reinstate due to operation of the detector's power supply crowbar protection circuit. The crowbar circuit is designed to isolate power to the detector in the event of a power surge.

The "B" FRV was inspected following the trip while the unit was at hot shutdown and no problems were noted. However, operating problems were encountered at approximately 60% power following the restart. The FRV was subsequently overhauled on July 14 while the unit was at reduced power and has since operated satisfactorily.

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The cause of the rod control system malfunction was an out of adjustment temperature error summator.

4.0 Immediate Corrective Action(s)

Operators followed appropriate plant procedures and quickly stabilized the unit following the reactor trip. Also, the shift technical advisor performed the critical safety function status tree review to ensure specific plant parameters were noted and that those parameters remained within safe bounds.

5.0 Additional Corrective Action(s)

The blown fuse in the NI control power circuit was replaced. The NI circuit was satisfactorily tested subsequent to the startup of the unit.

Instrument technicians manually reset the protection device in the source range power supply and reinstated the source range.

Subsequent to the restart of the unit, the temperature error summator in the rod control system was adjusted and the "B" FRV was overhauled while the unit was at a reduced power level.

6.0 Action(s) Taken to Prevent Recurrence

The personnel involved were disciplined. Instrument technicians have been issued instructions to use grounded meters for testing unless specifically directed otherwise. This event and similar events related to improper use of meters will be periodically discussed during the instrument technicians continuing training classes.

Additionally, Engineering will evaluate replacement of the N-31 power supply and investigate the cause of the isolation of the power supply by the crowbar circuit.

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7.0 Similar Events

Unit 2 LER 84-013. Use of an ungrounded power supply for a digital voltmeter while testing one of the power range NIs caused a dropped rod turbine runback that resulted in a reactor trip.

At that time, instructions were furnished to instrument technicians on the proper setup of test equipment. However, this action did not prevent the recurrence of a similar event because the technicians were not periodically reinstructed in this area.

8.0 Manufacturer/Model Number(s)

FRV - Copes Vulcan Model D100.

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VIRGINIA ELECTRIC AND POWER COMPANY
Surry Power Station
P.O. Box 315
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August 7, 1989

U. S. Nuclear Regulatory Commission Serial No.: 89-028
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016 Phillips Building License No.: DPR-32
Washington, D.C. 20555

Gentlemen:

Pursuant to Surry Power Station Technical Specifications, Virginia Electric and Power Company hereby submits the following Licensee Event Report for Unit 1.

REPORT NUMBER

89-026-00

This report has been reviewed by the Station Nuclear Safety and Operating Committee and will be reviewed by Safety Evaluation and Control.

Very truly yours,

M. R. Kansler
Station Manager

Enclosure

cc: Regional Administrator
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